

What is claimed is:

1. Multi-band low noise amplifier comprising:

a plurality of matching networks for receiving input signals from a plurality of frequency bands respectively;

5 a plurality of differential pairs, bases of said plurality of differential pairs being coupled to outputs of said plurality of input matching networks, emitters and collectors of said plurality of differential pairs are connected together, respectively;

10 a pair of common base transistors, emitters of said common base transistor pairs being coupled to collectors of said plurality of differential pairs;

a pair of inductors, one end of the inductor pairs being coupled to collectors of said common base transistor pair, the other
15 end being coupled to a power supply;

a pair of variable capacitors, one end of the inductor pairs

being coupled to collectors of said common base transistor pair, the other end being coupled to a power supply;

a pair of inductors, one end of said inductor pairs being coupled to emitters of said plurality of differential pairs, the other
5 end of said inductor pairs being interlinked; and

a current generator, one end of the current generator being coupled to a coupling point of said inductors, the other end of the current generator being coupled to ground.

2. The multi-band low noise amplifier of claim 1, wherein
10 said transistor is selected from a group consisting of a bipolar junction transistor, a MOS transistor and equivalents.

3. The multi-band low noise amplifier of claim 1, wherein only a predetermined kth differential pair is switched on and the rest of the differential pairs are switched off when the frequency
15 band of a received signal falls in the range of a predetermined kth frequency band.

4. The multi-band low noise amplifier of claim 1, wherein the capacitor pair and the inductor pair form a resonator pair, when the frequency band of a received signal falls in the range of a predetermined kth frequency band, variable capacitance value is
5 adapted to ensure the resonance frequency of the resonator is equal to the central frequency of the predetermined kth frequency band.

5. The multi-band low noise amplifier of claim 1, wherein a current flows through the predetermined kth differential pair when the frequency band of a received signal falls in the range of a
10 predetermined kth frequency band.

6. The multi-band low noise amplifier of claim 1, wherein the multi-band low noise amplifier further comprises a first control signal to control a switch for having the predetermined kth differential pair switched on by having the transistor base voltage
15 coupled to a voltage bias, and at the same time for having the rest of the differential pairs switched off by having the base voltage coupled to ground.

7. A fully-differential circuit comprising:

a plurality of matching networks for receiving input signals from a plurality of frequency bands respectively;

a plurality of differential pairs, bases of said plurality of differential pairs being coupled to outputs of said plurality of input matching networks, emitters of said differential pairs being coupled to collectors of said differential pairs;

a pair of common base transistors, emitters and collectors of said plurality of differential pairs are connected together, respectively;

a pair of inductors, one end of the inductor pairs being coupled to collectors of said common base transistor pair, the other end being coupled to a power supply;

a pair of variable capacitors, one end of the inductor pairs being coupled to collectors of said common base transistor pair, the other end being coupled to a power supply; wherein the capacitor

pair and the inductor pair form a resonator pair,

a pair of inductors, one end of said inductor pairs being coupled to emitters of said plurality of differential pairs, the other end of said inductor pairs being interlinked; and

5 a current generator, one end of the current generator being coupled to a coupling point of said inductors, the other end of the current generator being coupled to ground.

8. The fully-differential circuit of claim 7, wherein said transistor is selected from a group consisting of a bipolar junction
10 transistor, a MOS transistor and equivalents.

9. The fully-differential circuit of claim 7, wherein a current flows through a predetermined kth differential pair and only the predetermined kth differential pair is switched on and the rest of the differential pairs are switched off when the frequency band of a
15 received signal falls in the range of the predetermined kth frequency band; and variable capacitance value is adapted to ensure the resonance frequency of the resonator is equal to the central

frequency of the predetermined kth frequency band.

10. The fully-differential circuit of claim 9, wherein the fully-differential circuit is used in a multi-band low noise amplifier.

11. The fully-differential circuit of claim 7, wherein the
5 multi-band low noise amplifier further comprises a first control signal to control a switch for having the predetermined kth differential pair switched on by having the transistor base voltage coupled to a voltage bias, and at the same time for having the rest of the differential pairs switched off by having the base voltage
10 coupled to ground.

12. A receiver comprising:

at least one antenna for receiving a signal, the signal falls in the range of a predetermined kth frequency band;

at least one filter having a input being coupled to output of
15 said at least one antenna, the filter is used for filtering the received signal falling in the range of the predetermined kth

frequency band;

a low noise amplifier having matching networks for receiving input signals from a plurality of frequency bands respectively, a plurality of differential pairs, bases of said plurality of differential
5 pairs being coupled to outputs of said plurality of input matching networks, emitters and collectors of said plurality of differential pairs are connected together, respectively, a pair of common base transistors, emitters of said common base transistor pairs being coupled to collectors of said plurality of differential pairs, a pair of
10 inductors, one end of the inductor pairs being coupled to collectors of said common base transistor pair, the other end being coupled to a power supply, a pair of variable capacitors, one end of the inductor pairs being coupled to collectors of said common base transistor pair, the other end being coupled to a power supply, a pair
15 of inductors, one end of said inductor pairs being coupled to emitters of said plurality of differential pairs, the other end of said inductor pairs being interlinked; and a current generator, one end of

the current generator being coupled to a coupling point of said inductors, the other end of the current generator being coupled to ground; and

at least one signal converter having a input being coupled to
5 the output of the low noise amplifier, the signal converter being used for converting the received signal into a intermediate frequency signal;

wherein, a current flows through a predetermined kth differential pair and only the predetermined kth differential pair is
10 switched on and the rest of the differential pairs are switched off when the frequency band of a received signal falls in the range of the predetermined kth frequency band; and variable capacitance value is adapted to ensure the resonance frequency of the resonator is equal to the central frequency of the predetermined kth frequency
15 band.

13. The receiver of claim 12, wherein said transistor is selected from a group consisting of a bipolar junction transistor, a

MOS transistor and equivalents.

14. The receiver of claim 12, wherein the multi-band low noise amplifier further comprises a first control signal to control a switch for having the predetermined kth differential pair switched
5 on by having the transistor base voltage coupled to a voltage bias, and at the same time for having the rest of the differential pairs switched off by having the base voltage coupled to ground.